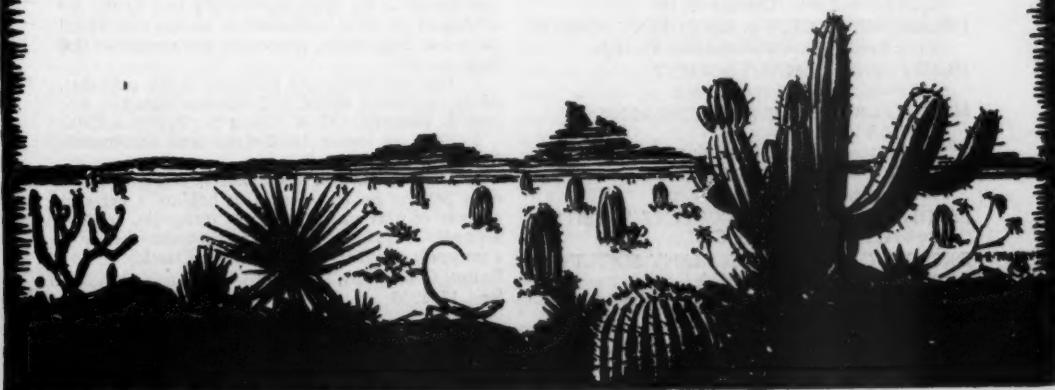


CACTUS AND SUCCULENT JOURNAL

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FIG. 75. Crested *Yucca valida* photographed by Charles Polaski in Baja California



CACTUS AND SUCCULENT JOURNAL

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Journal, published bi-monthly at Pasadena, for Octo-
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GLENN O. GRIFFIN, Notary
Sept. 18, 1959



FIG. 76. *Mammillaria wilcoxii* nestled in pine needles

Mammillaria wilcoxii in New Mexico

By PRINCE PIERCE

About a year ago while visiting with Mrs. Eunice Bullington in Deming, she mentioned finding *Mammillaria wilcoxii* in the mountains near Silver City. I was immediately interested, because I knew that she was one of the few persons in New Mexico mentioned in connection with this elusive little species, by the late W. Taylor Marshall in his article "Mammillaria wrightii" in the *Cactus & Succulent Journal*, Vol. XIV, May 1942. Further, I was particularly interested because I knew of no one at that time who could show me where or how they grew in New Mexico. Mrs. Bullington told me that she had found *M. wilcoxii* "under the pine trees" and "in the big rocks". She added that they were always difficult to locate. She was not exaggerating that part of it one bit! Only recently have I been able to confirm their existence in the state, although I have been hunting for them at regular intervals since that time. After searching fruitlessly for so long I began to doubt the value of Mrs. Bullington's helpful hints.

New Mexico has had about 15 years of insufficient rainfall during which time I began to think that the plants had become nearly extinct in their former habitat. That they formerly lived in New Mexico I had no doubt, because in questioning some of the "old timers" in the vicinity, I learned that as children they had found this species to be plentiful. In fact they had been

so much so that years ago the children used to go out and gather the fruits of the "birds nest cactus" much as one would gather strawberries in other climates. They called it "birds nest cactus" because it looks like a birds nest turned inside out. The old timers felt too that they had died out in recent years. Dr. Edward F. Castetter, Academic Vice-President of the University of New Mexico, who has long been working on a book of cactus to be found in New Mexico, once mentioned to me that he too had searched for this plant in vain.

Then one day I mentioned my problem to Newt "Cresty" Paradine of Phoenix. He used to live in Deming and I thought perhaps he might have found them at one time or another. Sure enough, he had seen them, and he too, told me to "look under the pine trees!" However he felt that I had been searching at too low an altitude. He told me of one particular area, where he felt that I should not fail to search. The problem now was not the searching, but getting into the higher hills. This is a real problem in New Mexico where there are very few roads leading into the higher mountains. I began hunting down all the old roads and trails. If I kept at it long enough I should eventually locate the habitat.

I tried the special location recommended by Paradine and found an old mining road which surprisingly enough went very high into the

mountains. This was what I had been looking for! I drove to an altitude of 6000 feet to begin looking and began to scour the hillsides methodically. Sure enough, after 45 minutes, there staring me right in the face was a tiny one-inch plant of *M. wilcoxii*! The hill was about a 40° slope, and the cactus was growing beneath a clump of grama grass and above barren dirt. The grass overhanging it gave it quite a bit of protection from both the wind and rain, and the barren slope beneath it gave the quick drainage it needed. The angle at which it was growing faced it directly into the winter sun, and gave it protection from the summer sun with the grama grass overhead when the sun was at its higher angle. If I had not approached it from below its position on the hill, I should never have noticed it. Maintaining a foothold while photographing the plant was quite a problem. The snow was still on the ground within 15 feet, and yet this plant was *not* dormant! Spring growth had already begun!

An hour later I found a second plant. This was located further up the same hill beneath a scrubby live oak tree. This plant had been growing for some time and was multicephalic! If you have not had the pleasure of finding a *Mammillaria* covered with clean new growth, you have truly missed something! The search is long and hard, but the reward is certainly exhilarating! My second plant was growing in the full sun where its new central spines glowed with the red of a ripe red raspberry. The many, many radial spines were a pure white, but the real surprise was that *all* the spines, both centrals and radials, were fuzzy with pubescence almost to the point of being feathery! A quick check with Craig's "Mammillaria Handbook" and with "Cactaceae" by Marshall & Bock convinced me that I had indeed found *M. wilcoxii* in New Mexico!

I continued searching for plants even though the sun was creeping around too far to the west. The temperature was beginning to drop to an uncomfortable degree. Two hours had passed without another plant. I gave up and decided to go home. Looking for a place suitable for turning around I thought that surely I shouldn't give up. Perhaps I was passing a plant right there. I stopped the car and went over by a huge ponderosa pine to look for another sunny spot. There wasn't a sunny spot, but right there at my feet in a nest of pine needles was a magnificent specimen. When I say "nest", I mean just that. A bird couldn't have placed them better, and a bird could have left the cactus just as an afterthought. The plant was growing in a solid cushion of pine needles at least four inches deep, which extended thirty feet in every direction.

My third *M. wilcoxii* was perfectly flat on top, with no sign of new growth such as was exhibited by the other two plants. Upon digging it, the roots extended only an inch under the soil (very black composed mostly of decomposed pine needles), but most of them extended about ten inches in every direction. One unusually long root extended for over 18 inches from the body of the three-inch plant. The soil was bone dry, and the cactus was very light for its size. It was quite hard to the touch. These characteristics indicate the extremely dry conditions under which this plant had developed and wintered. A photograph was in order and is now one of my prize slides.

I found one more plant only ten feet from the third, in another "nest" of pine needles. Of course, I was well primed for another three or four hours of hunting, but old mother nature, with her inevitable setting of the sun, warned me that February in the mountains, is no place to spend the night. Since blizzards are in season at this time of year, even though they are not as serious as those further north, they can seriously hamper one trying to drive on abandoned or poor roads!

My reports to my friends in the New Mexico Cactus & Succulent Society, were colored with all the interesting highlights I could muster, but nothing could match the fact that I had been able to confirm one more plant to our growing list of plants (cactus) known to be native to New Mexico!

April was my next opportunity to return to the habitat of *Mammillaria wilcoxii*. I was in unusually good form that day, having already found two very fine crests of *Opuntia spinosior*, *Agave parryi*, *Agave deserti*, and the magnificent *Coryphantha neomexicana*! I was accompanied by a friend of mine, Dr. E. M. Joneschild who was interested in seeing the "new to New Mexico" cactus. We drove to an altitude of about 6500 feet to start our search. No luck! In fact after hunting for about an hour the only things we had found were *Coryphantha aggregata* and a couple *Coryphantha arizonica*. Although both species are very beautiful, and the specimens were fine examples, we were just a bit discouraged. We moved the car to another spot about 300 feet down the hill. I had not been out of the car three minutes before I found four fine two-inch plants growing under a scrub live oak tree! Before Dr. Joneschild could get to my "find" he saw two more growing beneath a huge pine tree in a nest of pine needles! Then the search was on! We located several more on the same hill, and then as we climbed, we approached our former location. In fact the closer we got to the other place we had been hunting, the more Dr. Joneschild remembered a beautiful little cedar tree that he



FIG. 77. *Mammillaria wilcoxii* growing under scrub oak in pine forest

wanted to show me. We got to the little tree, and it WAS a beauty, for there at its foot was the granddaddy of all *M. wilcoxii*! He had been so taken with the beauty of the tree that he had missed the most beautiful cactus we had seen all day!

We had occasion to search several large arroyos, and to climb to an altitude of about 7500 feet to inspect a huge abandoned mine. The several sites were scattered throughout an area of about 100 square miles. We inspected at least 10 miles of roadway with periodic penetration of the forest and the hills and arroyos. After walking up hill and downhill on slopes of 35° to 40°, you just don't have much feeling left in your feet or in your head at the end of the day! Don't get me wrong! It was fun, but eventually you begin to get a little numb, particularly if you don't do it all the time. The main thing I had wanted to do was to confirm a strong stand of *M. wilcoxii* in New Mexico, in an area that could never be construed as a border habitat. That is now the case. I am certain that *M. wilcoxii* extends throughout the Silver City, New Mexico area at altitudes of 5000 to 7500 feet in what you might call the ponderosa pine-live oak transition zones. I feel that the southern foothills of the Gila Wilderness will eventually prove to be a habitat for this plant too. The old timers used to see them there when they were children. We new timers just need to do a little better hunting.

Naturally I have also become aware of the decided differences to be found between *Mammillaria wilcoxii* and *Mammillaria wrightii*. If one has had the good fortune to hunt and find both species, there can be no doubt as to their

differences. Neither the flowers nor the vegetative characteristics resemble one another. Marshall set forth the differences in his article "*Mammillaria wrightii*" in the May 1942 journal previously mentioned here. When one is lucky enough to find a specimen of *M. wrightii* in a rapidly growing condition, the plant is quite flabby and fleshy to the touch. You can get very much the same sensation by feeling the fleshy part of your thumb next to the palm of your hand. On the other hand, a *M. wilcoxii* is firm to the touch when rapidly growing. At no time is the former so firm. When one is freshly dug from the earth, even when desiccated in the wintertime, you must be extremely careful or you will crush it beyond hope of recovery. *M. wilcoxii* under the same conditions is very firm of body, sometimes hard to the touch. The blue metallic powder which is found on a rapidly growing *M. wrightii* around the tubercles and in the axils and on the new growth gives a luster which is entirely unique. This has previously been mentioned by Ladislaus Cutak in the November 1936 Missouri Botanical Garden Bulletin.

I believe it to be one of the most important characteristics of *M. wrightii*. I have never seen so distinctive a luster on any other cactus native to the southwestern part of the United States. Certainly it is not to be observed on any of the *M. wilcoxii* I have collected, even though many have been found in a growing condition.

I have found absolutely no pubescence of the spines of *M. wrightii*, even under the most ideal of growing conditions. Yet the pubescence of the spines of *M. wilcoxii*, though slight in a

few cases, is always observable in new growth, and in some cases can be very well compared to that exhibited by *M. lasciacantha*. The floral and fruiting characteristics cannot be listed at this time, since I have only recently collected these plants in New Mexico. They are just now showing buds. I will prepare a report of these other phases of the New Mexico *M. wilcoxii* at a later date. If after reading this article, and comparing the characteristics of these plants that I have listed at the end of this article, with the characteristics published by W. Taylor Marshall, and those published by Craig in his

"Mammillaria Handbook", you feel that you have something to add which will be of help in distinguishing this species, I welcome your comments or letters. You may address them to: Mr. Prince Pierce, 510 San Lorenzo N.W., Albuquerque, New Mexico.

For convenience in comparison of the *M. wilcoxii* found in New Mexico with those described by Marshall in the Cactus & Succulent Journal, May 1942, and with Craig's description in The Mammillaria Handbook, pp. 186-188, I have arranged the botanical characters below:

Marshall	Craig	N.M. Plants
Shape: Globose to cylindric, simple or cespitose, hidden by spines.	Simple, occasionally branching from base, depressed globose to short cylindric, rounded above, to 10 cm. high.	Simple, occasionally branching from base, or cespitose, globose when growing, flattened and withdrawn to soil surface in winter.
Size: 2 to 9 cm. high, 5 to 15 cm. in diameter.	Size as above.	Size 2 to 9 cm. high, up to 10 cm. in diameter, and probably larger.
Tubercles: 1 cm. to 1.5 cm. long, terete to laterally flattened.	Tubercles widely separated in 5 and 8, also 8 and 13 spirals, flabby in texture, bright to dark glossy green, conical cylindric, terete, with watery sap, variable in length to 20 mm., 5 mm. wide at base.	Tubercles in 8 and 13 spirals, widely separated when growing, difficult to count when dormant, firm of texture except very young plants which are flabby, bright green to dark gray-green, up to 1.5 cm. long, terete. Gloss variable, sap watery.
Areoles: Oval, 2 mm., bearing white to yellow wool.	Areoles round to oval, 2mm. wide, with scant dirty white wool, very soon naked. Axils naked	Areoles round to oval, 2 mm. wide with white wool on nascent tubercles, very soon becoming naked. Axils naked
Radials: 11 to 18 of which 3 to 4 are directed downward, 1 to 3 upward, but majority are lateral, 1.5 to 2.2 cm. long, setose, white to light brown becoming horn-colored in age.	Radial Spines 14-22 (30?), 10-15 mm. long, lateral longer, bristle-like to thin acicular, white with brown tip, pubescence variable like centrals, horizontal.	Radial Spines 14-22, to 12 mm. long, thin acicular, white to white with brown tip, all pubescent, some extremely so, most pubescence lost with age. Shrinking of plants for winter seems to cause radials to bend into a lateral position which is retained, but they are formed in perfect radial formation around areoles.
Centrals: 2 to 5, mostly 3, 2 to 5 of which are hooked, dark brown with white bases.	Central Spines 1-3, (variable, given as many as 5-6), 20-30 mm. long, stout acicular, stiff, smooth to pubescent in varying degrees from entirely smooth to feathery pubescent, 1 or more hooked, dark amber to reddish brown, paler below, divergent, porrect.	Central Spines 1, rarely 2, always hooked, 10-22 mm. long, acicular, stiff, pubescence very variable, seeming to vary with color of central spines; plants with light reddish brown usually very pubescent, almost feathery, while dark reddish brown spines usually accompany quite smooth spines. The darker reddish brown spines almost always are much more robust.

CORRECTION

On our paper Some Notes on "Cactus Chemurgy" in the Sept-Oct. Journal the lines at the bottom of the right hand column, page 135, should read: "The value for the solar energy reaching the earth is 430 BTU/sq. ft./hr," rather than the rather confusing set of symbols and units given.—ROBERT R. CRUSE

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Icones Plantarum Succulentarum

18. *Adromischus fragilis*, sp. nov.*

By P. C. HUTCHISON

In the article in which *Adromischus rodinii* Hutchison was described (*Cact. Succ. Jour. Amer.* 25: 136-138, 1953) it was pointed out that Robert J. Rodin collected two additional new species of *Adromischus* in Namaqualand in 1947-1948. Rodin 1620 was one of these; it appeared, judging from vegetative characters alone, to be a new species, but it did not produce flowers. During correspondence with A. J. A. Uitewaal, of Amsterdam, I sent a photograph of this plant to him in 1953 under the manuscript name *Adromischus fragilis*. He commented that the species was known to him from plants cultivated at Kew, and that he had drawn up a complete description of the taxon for publication as a new species, but that as no locality data were available, he would relinquish publication rights on this new species.

In March, 1954, we received from H. Hall of the National Botanic Garden, Kirstenbosch, South Africa, a living plant which he had collected which was of similar morphology to the Rodin collection, and which I presumed to be the same species. Later in the same year three additional plants of the same collection were forwarded by H. Herre, of Stellenbosch Botanic Garden, South Africa. In 1955, Rodin 1620 flowered for the first time, and in 1956 both it and a plant of the Hall collection flowered, and all specimens have flowered yearly since then. These two collections are treated here as varieties of a single species, the collective description for which follows:

ADROMISCHUS FRAGILIS Hutchison, sp. nov.
Radices fibrosae; caules erecti demum procumbentes brunneo-purpureae demum griseae; folia horizontalia vel suberecta elliptico-teretia, in sectioni transversali rotunda vel ovalia, obscure griseo-viridia et viridi-vel purpureo-maculata; inflorescentia simplex, usque ad 16 cm. longa, basi 2-6 cm. bracteas 3-7 ovatas rubras steriles gerens; perianthium utrinque glabrum, lobis patentibus ovatis acuminatis 2.5-3 mm. longis latisque, marginibus incurvatis undulatis, in sinibus plicatis; squamae nectariferae aliae.

Roots fibrous. Stem at first ascending or erect, later sometimes procumbent, branching at any point, up to 50 cm. long, up to 1 cm. in diameter,

brownish purple, later scurfy or scaly gray. *Leaves* horizontal to suberect, usually elliptically terete, occasionally variable in shape, round or oval in cross-section at all points, usually rounded



FIG. 78
Adromischus fragilis Hutchison, var. *fragilis*, the clone-type, U. C. B. G. 50.1180, about 0.8 x.

to subacute at the apex, very rarely with an obscure yellowish margin, dull gray-green irregularly blotched with greenish to purplish spots, often suffused with purplish rose, the grayness from wax produced by innumerable minute glands. *Inflorescence* simple; peduncle 5 to 16 cm. long, up to 2 to 3 mm. in diameter, greenish

*University of California Botanical Garden (Berkeley)
 Contribution Number 158.

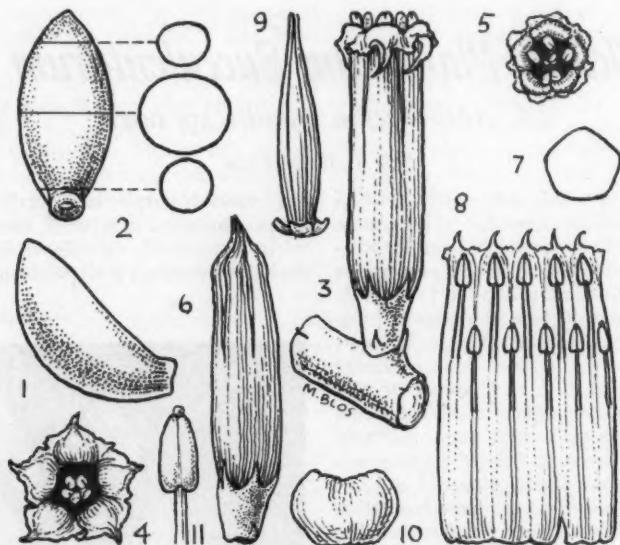


FIG. 79

Adromischus fragilis Hutchis. var. *fragilis*, the clonotype, U. C. B. G. 50.1180.
 1. Leaf, side view. 2. Leaf, top view and cross-sections. 3. Flower. 4. Perianth limb, expanded. 5. Perianth limb, reflexed. 6. Bud. 7. Cross-section perianth tube at midpoint. 8. Stamen insertion. 9. Carpels. 10. Nectary scale. 11. Anther.
 1, 2, natural size. 3-9, x3. 10, 11, x9. Drawing by M. Blos, 1955.

to purplish, glaucous, the sterile portion with 3 to 8 ovate red bracts. *Calyx* lobes deltoid, acuminate, 1 to 1.5 mm. long and wide, or somewhat longer. *Perianth* glabrous inside and out, the cross-section at midpoint pentagonal, the sinuses indented 3 to 4 mm. from the mouth, extending to the base from there as obscure to conspicuous greenish white or pale green striae, the limb lobes connate, spreading, then reflexed or only the lobe apices recurved, the spreading lobes ovate-acuminate, 2.5 to 3 mm. wide and long, the margins upturned, ruffled, pleated at the sinuses. *Stamens* biserrate, the filaments 3 to 5 mm. long, green, those of the upper series the longer and wider below, the anthers included or exerted, oblong but narrowed above, often somewhat irregularly shaped, white or the valves with a central longitudinal band of pale maroon, the terminal globule translucent, unstalked. *Carpels* 10 to 15 mm. long, green. *Nectary scales* \pm 1 mm. long, 1 to 2 mm. broad, white, the apex shallowly concave or broadly notched, the sides convex, the corners rounded.

The range of this species, as presently known, is from Helsberg to Numees in the Richtersveld, Namaqualand, South Africa. The holotype is cited under the variety *fragilis*. The specific name

refers to the ease with which leaves become detached; jarring the plant or touching individual leaves causes them to drop.

var. *FRAGILIS*. *Folia usque ad 3 cm. longa, 1.5 cm. lata, usque ad 1 cm. crassa, apice subacuta; perianthii tubus utrinque viridis 10-13 mm. longus, ubique 3 mm. diam., limbo albo, demum omnino reflexo; filamenta 3-4 mm. longa; antherae exsertae; carpella 10-12 mm. longa; squamae nectariferae \pm 1 mm. longae, usque ad 2 mm. latae.*

Leaves up to 3 cm. long, 1.5 cm. wide and 1 cm. thick, subacute, seldom variable in shape, the spots small. *Peduncle* 10 to 16 cm. long, greenish, the sterile bracts 3 to 6, the rachis 6 to 10 cm. long, the flowers 17 to 33, single. *Calyx* lobes 1 mm. long and wide. *Perianth* tube green inside and out, 10 to 13 mm. long, up to 3 mm. in diameter, the limb white, finally entirely reflexed. *Filaments* 3 to 4 mm. long; anthers exerted. *Carpels* 10 to 12 mm. long. *Nectary scales* \pm 1 mm. long, 1 to 2 mm. wide.

South Africa, Namaqualand, Richtersveld, near Helsberg, leg. R. Rodin 1620, University of California Botanical Garden 50.1180 (BOL-Holotype).

This variety is immediately distinguishable from the following by its smaller, subacute, seldom variable leaves, smaller flower, and white perianth limb which finally is entirely reflexed against the green tube.

var. *NUMESENSIS* Hutchison, var. nov. *Folia usque ad 5 cm. longa, 1.5-2.5 cm. crassa, apice rotundata, interdum maxime variabilia; perian-*

tum tubus externe viridis et fuscorubro-tinctus, intus viridis et in fauce et prope carpella fuscorubro-tinctus, 13 ad 15 mm. longus, usque 4 mm. diam., limbo non reflexo tantum apicibus acuminatis loborum recurvatis, lobis in parte centrali et apice pallide fuscorubris, marginibus albidis; filamenta 4-5 mm. longa; anterae inclusae ad exsertae; carpella 13-15 mm. longa; squamae



FIG. 80

Adromischus fragilis Hutchison var. *numeensis* Hutchis., the clonotype,
U.C.B.G. 54.113-1, about natural size.

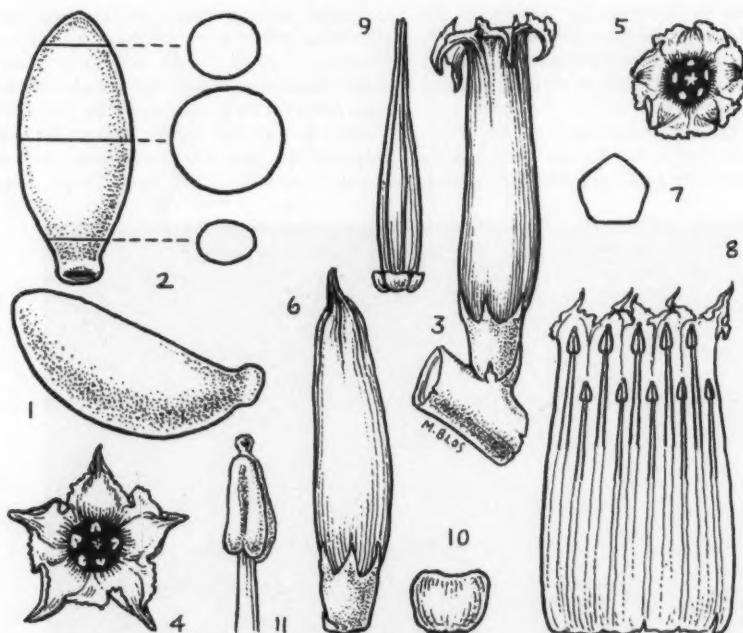


FIG. 81

Adromischus fragilis Hutchison var. *numeesensis* Hutchins., the clonotype, U. C. B. G. 54.113-1. 1. Leaf, side view. 2. Leaf, top view and cross-sections. 3. Flower. 4. Perianth limb, expanded. 5. Perianth limb, recurved. 6. Bud. 7. Cross-section perianth tube at midpoint. 8. Stamen insertion. 9. Carpels. 10. Nectary scale. 11. Anther. 1, 2, natural size. 3-9, x3. 10, 11, x9.

Drawing by M. Blos, 1956

nectariferae usque ad 1 mm. longae, usque ad 1.5 mm. latae.

Leaves up to 5.5 cm. long, 1.5 to 2.5 cm. wide, up to 2 cm. thick, rounded at the apex, variable in shape, the spots large. Peduncle 5 to 11 cm. long, purplish, the rachis 2 to 5 cm. long, the flowers 15 to 22 in 1- to 3-flowered cymes. Calyx lobes 1.5 mm. long and broad. Perianth tube green tinged with maroon, inside green tinged with maroon at the throat and around the carpels, 13 to 15 mm. long, up to 4 mm. in diameter, the lobe margins whitish, the central part and acuminate apex pale maroon, only the apices recurved. Filaments 4 to 5 mm. long; anthers included or barely exerted. Carpels 13 to 15 mm. long. Nectary scales up to 1 mm. long, up to 1.5 mm. wide.

South Africa, Namaqualand, Richtersveld, Numees, leg. H. Hall, University of California Botanical Garden 54.113-1 (BOL-Holotype).

The clonotype was received from Mr. Hall under the National Botanic Garden (Kirstenbosch) number 692/53. Three additional plants were received from Mr. Herre under the Stellenbosch Botanical Garden number 30012. The de-

scription is based on all four clones cultivated under glass.

This variety is immediately distinguishable from the preceding by the leaves (often highly variable in shape) being larger, duller, and with rounded apices, the flowers large, the perianth limb colored and not tightly reflexed (only the lobe-apices recurving), the tube narrowed gradually above, and the anthers often tinged maroon.

Hall remarked in his notes on this collection that he had never seen "such large, egg-shaped leaves, readily falling at the slightest touch, with some coloured spots. It was about 2500 ft alt., growing in association with *Conophyllum dissitum*, *Pachypodium namaquanum*, *Haworthia tessellata* and a *Gasteria*, and it was usually under small bush."

Vegetative variation in the leaves of a single plant, and of different plants is great in *A. fragilis*, as it is in a number of species of *Adromischus*. Plants of variety *numeesensis* may vary from the shapes given as follows: leaves occasionally truncated or the apex flattened or barely concave; leaves as broad as long and then often with flattened apex; leaves nearly subacute. Each

of these leaf types may have or may lack a distinct cartilaginous margin which very rarely may extend to the petiole. The maculations may be present on the lower half of the leaves but are generally more remote there and never extended on the petiole. Leaves of the variety are generally duller than those of the type. The floral differences seem more distinctive than do the vegetative, but only a single clone of var. *fragilis* has been examined, and perhaps when further material of this species becomes available, these differences may break down.

The leaves of most species of *Adromischus* are easily removed, but in only three species known to me will they drop at the barest touch. The

other two, which are undescribed, are not as delicate in this respect as *A. fragilis*. Intact plants of *A. fragilis* cannot be shipped, and it is to be expected that distribution of this new species will be accomplished by shipping leaves rather than cuttings or plants. Detached leaves root readily and quickly produce new plants; culture presents no problems.

The affinity of this new species is with the type of the genus, *A. hemisphaericus* (L.f.) Lem., and its allies.

Completion of this manuscript was made possible by a John Simon Guggenheim Memorial Foundation Fellowship, 1959, and a sabbatical leave from the University of California, Berkeley.

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FIG. 82. Habitat photo of T. MacDougall's No. B-85 taken at 10,000 feet at the peak of Cerro Yucunino to the south of Tlaxiaco, Oax. The flowering plants are over six feet tall.
See cover of last Journal, Vol. 31, No. 5.



FIG. 83

Overhead view of a specimen of *Crassula 'Morgan's Beauty'* in Dr. Morgan's collection.
Photo by the author.

NEW SUCCULENT CULTIVARS

By MYRON KIMNACH

2. *Crassula 'Morgan's Beauty'*

Most of our popular hybrids, whether of roses and other garden plants or of such succulents as *Epiphyllum*, are the culmination of long-continued line-breeding, selection or back-crossing; few worthy hybrids grown today are primary crosses, i.e., the first generation offspring of two species, for it is usually necessary to carry out a breeding program through a number of generations to eliminate the faults of a hybrid series and to encourage the development of its more attractive qualities.

A notable exception is *Crassula 'Morgan's Beauty'*, perhaps the most successful succulent primary hybrid, as it possesses nearly all of its parents' virtues and few of their faults. Its thick,

silvery leaves closely crowd the short stems, and in spring the center of each rosette, whether single or clustered, is filled with a nearly stemless tuft of dark pink, sweetly fragrant flowers. When in bloom there are few hybrids, or even species, which are more appealing, and a specimen is admired equally by collectors and those who dislike succulents. It is also easy to grow and propagate and therefore doubtless will become widely grown for many years to come.

The history of this hybrid is a rather confused one. About 1940 the late Dr. Meredith Morgan of Richmond, California, crossed *C. falcata* with the very dwarfed *C. ausiensis*. The seedlings matured into low clustered plants with whitish

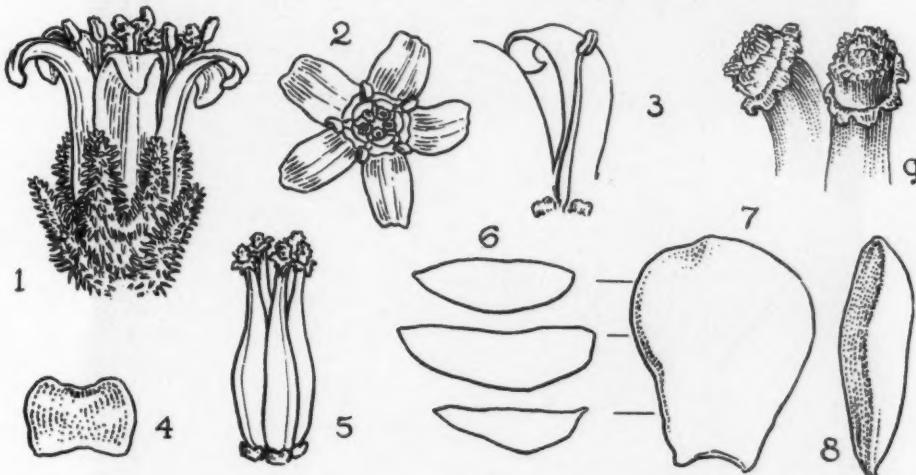


FIG. 84

Crassula 'Morgan's Beauty', UCBG 51.974. 1. Flower, x 6.5. 2. Flower, apical view, x 5. 3. Stamen insertion, x 4. 4. Squama, x 24. 5. Gynoecium, x 6. 6. Leaf sections, x 1. 7. Upper face of leaf, x 1. 8. Leaf, side view, x 1. 9. Stigmas, x 18. 1-8 of drawing by Mary Barnas, 1952; 9 by Mrs. M. Blos, 1959.

leaves, rather spindly inflorescences and pale pink flowers. Though fairly interesting, this cross had obvious faults and, although still grown in a few local collections, it hardly deserves naming or wide distribution. Dr. Morgan felt that it would be greatly improved if the growth and inflorescences were more compact, and he considered crossing it with a species possessing such characters. A *Crassula* with extremely compact growth and inflorescence, *C. mesembryanthemopsis* (see Fig. 85), was flowering about 1945 in his collection along with his hybrid and *C. falcata*. Unfortunately there is now some uncertainty as to which of these he crossed at that time, although he later told me that the parents of *C. 'Morgan's Beauty'* were *C. mesembryanthemopsis* and his earlier hybrid. However, in 1954 I pollinated a plant of *C. mesembryanthemopsis* (UCBG 49.1968) with pollen of *C. falcata* (UCBG 47.546, Rodin 1237); the three seedlings raised are nearly indistinguishable from *C. 'Morgan's Beauty'*, though their leaves are slightly smaller and the flowers paler red. As they are inferior to Dr. Morgan's clone they will not be distributed, but they do more or less prove, as he himself finally believed, that the parents of *C. 'Morgan's Beauty'* were actually *C. falcata* and *C. mesembryanthemopsis*.

Dr. Morgan raised two seedlings which differed only in stamen length and in their lighter or darker flowers. The one with deeper red flowers he propagated and sent to Hummel's Exotic

Gardens and Johnson's Cactus Garden, both of which later distributed the hybrid under the names "Morgan's Pink *Crassula*" or *Crassula x morganiana*. The latter was a tentative name originated by P. C. Hutchison of the U. C. Botanical Garden, but later he chose the name *Crassula 'Morgan's Beauty'*. In 1956 the latter name was mentioned by Mrs. H. A. Delap in an English journal,¹ and as this antedates the appearance of the two catalog names it must be considered the only correct one. Mrs. Delap showed a photo of the hybrid growing in the outdoor rockery of the U. C. Botanical Garden, and incorrectly stated the parentage to be *C. falcata* x *C. deceptrix*. As a result, Dr. B. K. Boom, who is doing excellent work in describing succulent hybrids cultivated in Europe, also gave this parentage in an article in a Dutch journal.² He suggested that the best name would be *Crassula morganiana* cv. 'Morgan's Beauty', the Latin name applying to all *F₁* seedlings derived from crossing these two species and the cultivar name to Dr. Morgan's clone. However, as already mentioned, the Latin portion of this name is antedated by the one used here and there is also no point in distinguishing clones when only one is in cultivation.

Dr. Morgan later tried to obtain *F₂* seedlings from this hybrid, particularly by crossing it back

1. Nat. Cact. Succ. Journ. 11: 54, 1956.

2. Succulenta 1957: 122, 1957.

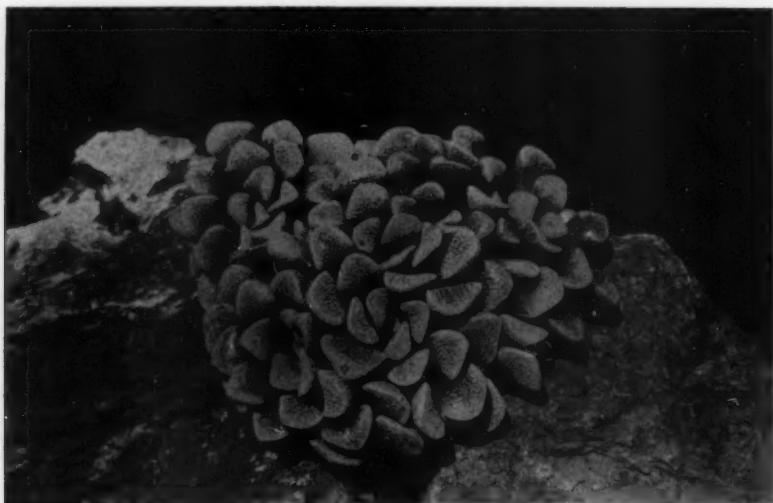


FIG. 83
Crassula mesembryanthemopsis. Photo by P. C. Hutchison.

with *C. falcata*, for back-crosses usually produce more variable offspring than primary ones. No seed was obtained, however, and apparently the hybrid is sterile.

This is an unsatisfactory plant for an outdoor garden, at least in central California. A large planting at the Botanical Garden grew well during summer, but the winter rains caused the leaves to become spotted with brownish orange and finally rotted. A similar affliction sometimes attacks *C. falcata*, which, however, generally does quite well outdoors in this area. The other parent, *C. mesembryanthemopsis*, is strictly an indoor plant with us, being easily killed by excessive moisture, and this species is probably responsible for the sensitivity of *C. 'Morgan's Beauty'* to moisture. Neither should this hybrid be grown in a humid, shady greenhouse, for the leaves become greenish, less compact and sometimes orange-spotted. Under shady conditions the flower color is pale pink, but if the plant is kept in a sunny position the flowers are red. The specimen shown in Fig. 83 was grown during winters in Dr. Morgan's glasshouse on an airy, well-lit shelf and during summer on his patio. The plants are dormant during and for some time after flowering, but watering may be increased when new offsets appear. A fairly rich soil and thorough but rather infrequent waterings seem best, and water should be kept off the leaves. Stem or leaf cuttings root easily.

Crassula 'Morgan's Beauty'

Hybridizer: Dr. Meredith Morgan, ca. 1945.

Parents: *C. falcata* x *C. mesembryanthemopsis*.

Plant forming a compact, many-branched mound up

to more than 20 cm. wide and 10 cm. high; branches 3 to 6 cm. wide, narrowest at apex, in cross-section square with incurved sides; stems hidden by leaves, ca. 6 mm. thick; leaves in four slightly spiralled ranks, in nearly opposite pairs, barely connate, contiguous, obliquely obovate-oblong, ca. 3 (1 to 4) cm. long and 2 (1 to 3) cm. wide, ca. 5 mm. thick near middle, the upper ones smallest, obtuse or rarely subacute, the upper surface near apex with a diagonal, truncate plane, the entire leaf thickly covered with white, usually contiguous, globose papillae which nearly obscure the green epidermis, the leaf-color silver-grey tinged greenish; inflorescences appearing in January and February, terminal, hemispherical, cymose, sweetly fragrant, 2 cm. high, ca. 3 cm. by 2 cm. wide, the peduncle usually hidden, less than 1 cm. long, the bracts ovate, fimbriate-papillose, the pedicels nearly lacking, the sepals fimbriate, the flowers 7 mm. long, the limb 6 mm. wide, the petals dark pink.

CHRISTMAS SUGGESTIONS

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CULTIVATED AND NATIVE AGAVES IN THE SOUTHWESTERN UNITED STATES

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PART 5



FIG. 86

Agave peacockii. Grown in the Huntington Botanical Garden, San Marino, California. Rosette approx. 1/10 natural size. Inserts: left and right show close-up of flowers and bracts.

Agave peacockii Croucher, Gard. Chron. 1873: 1400, 1873.

A. roezliana var. *peacockii* (Croucher) Trelease in Bailey Standard Cyclop. Hort. 1: 237, 1914.

A. henriquesii Baker, Gard. Chron. 732, 1887.

Distribution: Tehuacan, type cultivated in Europe.

Rosette single, 4 to 5 m. in diameter, about 20 leaved; leaves 60 to 75 cm. long, 7 to 10 cm. broad, glabrous, straight or somewhat plicate, base biconvex, 6 cm. thick, becoming thinner and shallower, boat-shaped above middle; armature chocolate brown, spine 2 to 3.5 cm. long decurrent into the continuout or sometimes broken horny margins; teeth 1.5 to 4 cm. apart, 3 to 5 mm. long, sometimes double-tipped, often 1 to 3 smaller teeth present between two larger ones; horny margin, when present, 2 mm. broad; inner leaves near inflorescence entire, acuminate; inflorescence 2.30 m. high, bracts spreading or reflexed, narrowly lanceolate to linear, 8 to 15 cm. long, soon dry and inrolled; flowers mostly in pairs, 5 cm. long, perianth 2 cm. long, purple tinged. April-May.

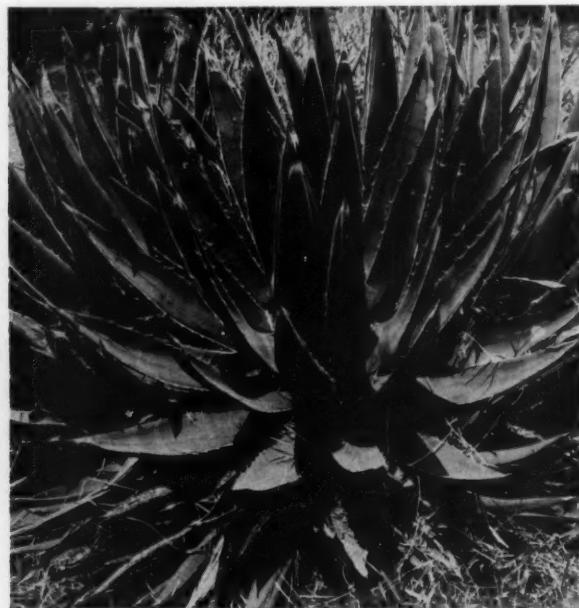


FIG. 87. *Agave triangularis*. Grown in the Huntington Botanical Garden, San Marino, California.
Approx. $\frac{1}{2}$ natural size.



FIG. 88. Left: *Agave triangularis* var. *rigidissima*. Grown by L. Ellenwood, San Fernando, California.
Approx. $\frac{1}{7}$ natural size. Right: *Agave triangularis* var. *subintegra*. Grown in the Huntington Botanical
Garden, San Marino, California. Rosette approx. $\frac{1}{10}$ natural size.

Agave triangularis Jacobi, Wochenschr. Ver. Beförd. Gartenb. 1869; 178, 1869.

Distribution: type cultivated in Europe from near Tehuacan.

Rosette 20 cm. in diameter, stoloniferous, leaves thick and very rigid, dark green, triangular, lanceolate, 25 cm. long, 5 cm. wide without ventral stripe nor dorsal lines; armature light brown soon gray; spine triangular, 3 mm. thick, 20 mm. long; teeth gently curved or triangular 3 to 7 mm. long; 15 to 25 mm. apart, the nearly straight intervening horny margin 1 to 2 mm. wide; scape slender, 3 to 5 m. high, flowers cream-colored. August.

Agave triangularis var. *rigidissima* (Jacobi) Trelease in Bailey, Stand. Cycl. Hort. 1: 237, 1914.

Agave rigidissima Jacobi, Wochenschr. Ver. Beförd. Gartenb. 1869: 179, 1869.

Distinguished from the typical species by the larger, more robust rosette to 60 cm. in diameter with leaves 35 cm. long, 13 cm. broad and 3 cm. thick at base.

Agave triangularis var. *subintegra* Trelease in Standley, Trees and Shrubs of Mexico, Contr. U. S. Nat. Herb. 23: 138, 1920.

A. kerchovei var. *inermis* Baker, Gard. Chron. new series 7: 527, 1877.

A. deformis Berger, Die Agaven 95, 1915.

Distinguished from the typical species by having few small or no teeth on leaf margin and longer more slender leaves 65 to 70 cm. long with or without ventral stripe.



FIG. 89

Agave kerchovei. Grown by H. Johnson, Paramount, California. Approx. $\frac{1}{6}$ natural size.

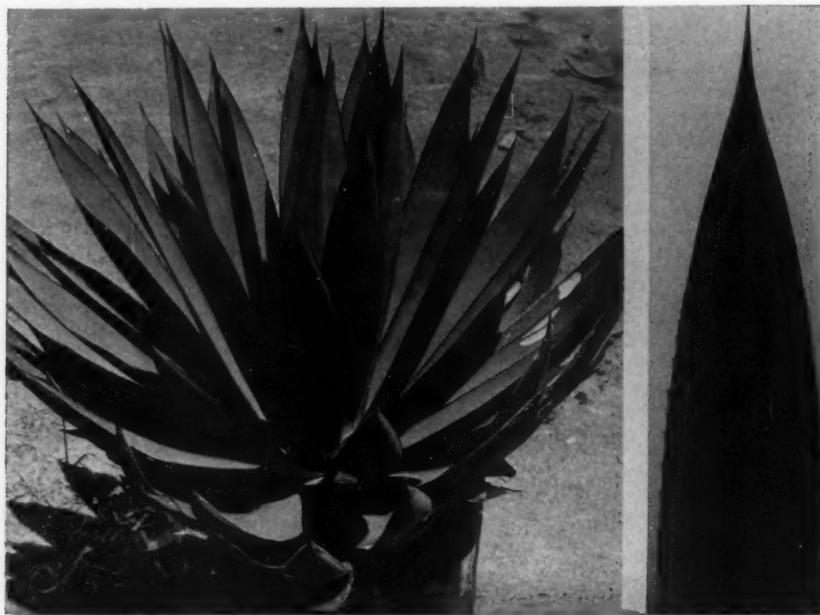


FIG. 90

Agave kerchovei var. *pectinata*. Grown by H. Johnson, Paramount, California. Rosette approx. 1/7 natural size. Right: close-up of leaf showing armature characteristics.

***Agave kerchovei* Lemaire, Ill. Hort. 11: 64, 1864.**

A. beaucarnei Lemaire, Ill. Hort. 11: 65, 1864.

Distribution: Type cultivated in Europe, probably from Puebla.

Rosette single, 40 to 60 cm. in diameter; leaves 20 to 35 cm. long, 3 to 5.5 cm. broad, stiff near base, dark green, without ventral stripe or dorsal lines, armature dark purple-black becoming gray in age; spine 1.5 cm. long, continuous into the 1 mm. wide horny leaf margin, teeth 5 to 7 along middle of leaf margin, 1 to 2 cm. apart, .05 to 1 mm. long, entire near apex and base; inflorescence dense, erect.

***Agave kerchovei* var. *pectinata* Baker, Gard. Chron. new series 527, 1877.**

Distinguished from the typical species by the close-set teeth 5 to 15, (average 10) mm. apart, occasionally with 1 to 2 minute prickles between two larger ones.

***Agave vittata* Regel, Gartenflora 7: 313, 1858.**

Agave bynaldii Todaro, Hort. Panorm. 1: 88, 1876.

Agave toneliana Baker, Gard. Chron. 1881: 362, 1881.

Distribution: Nuevo León; type cultivated in Europe, probably from the mountains near Monterrey.

Rosette single or with few offsets, 1.3 m. in diameter, leaves 50 cm. long, 3.5 cm. broad, dark green; spine purplish black, 1 cm. long, decurrent into the continuous, at first light brown, soon gray; horny margin .05 mm. broad; teeth 1.5 to 2 cm. apart, about 1 mm. long; scape 4 m. high, inflorescence dense, 2.5 m. long; bracts linear, involute, 6 to 13 cm. long, 15 mm. broad at base. May-June.



FIG. 91

Agave vittata. Grown in the Huntington Botanical Garden, San Marino, California.
Rosette approx. 1/12 natural size.

TREASURER'S REPORT TO THE AFFILIATES

What do the affiliates get for their dues? We hear this complaint so often. Let us look over the Ledger to see what the figures reveal.

Affiliate dues collected the last two years (between conventions)	\$245.00
Received from Convention Treasurer 1959 (Registration fees less local expenses)	114.35 \$359.35 \$359.35
Convention expense	
Postage	66.75
Stationery	13.52
Badges	24.81
Printing	
Envelopes	10.92
Information sheets	88.40
Reservation forms	26.00
Programs	43.68
Ticket books	39.00
Initiation certificates	15.60
	\$328.68 \$328.68
Affiliate Secretary Expenses & Slide postage to Affiliates	23.19
Balance in Affiliate Fund	\$ 7.48

The Affiliate dues plus the registration fees at the convention just about balance the printing and mailing costs, not to say anything about some other expenses which were paid personally by some of the officers.

This leaves very little in the Affiliate Fund with which to obtain new slides and to provide other services which the Board of Directors would like very much to provide for the Affiliates if there were funds

available. Many of the present collection of slides have been donated by various members.

The \$4.00 membership and subscription fee goes entirely for the publication of the Journal. Here we are getting an outstanding publication for a price that is way below what other societies are paying for their magazines.

The Society has no source of income except the few Associate Memberships (\$1.00) which are paid largely by the wives of the Board members and a few others. New Memberships at \$4.00 sent in directly to the Affiliate Secretary net the Society \$1 each.

All traveling and other expenses of the officers of the Society are paid by them personally and not by the Society.

In past years, there were some enthusiastic members who helped the finances of the Society by contributing to a Sustaining Fund. These contributions individually were not large but the total of all of them was a big help in maintaining the activities of the Society. Sorry to say this source of income has ceased. One very kind member did donate a small sum to the Society but this has been gradually reduced over the years.

R. T. CRAIG, Treasurer

EDITOR'S NOTE

This last issue of the Journal in volume 31 is mailed early to avoid the Christmas mail rush. If your subscription expires before the start of volume 32, you will receive an expiration notice that you should return promptly in order to be sure of the next issue.

DESERT FLOWERS UNDER GLASS

The story of my experiences and delight in growing and flowering Cacti and Succulents in a small glasshouse in Christchurch, New Zealand

By MARJORIE E. SHIELDS

CHAPTER 14

ALOES

Four large Aloes dominate this end of the bench. They look so grand and dignified with their huge rosettes of leaves held high on long straight stems like palm trees. They are shy to flower in the glass-house for they need hot sun and fresh breezes to stir the flower spikes into blossoming. This one is "tree-like" *A. arborescens*. Once I put it out in the garden for the summer and it sent up its flower spike, but as it is a winter bloomer it didn't have a chance to show what it could do before the frosts came. It grows almost wild on the hills around the sea coast not far from here and has magnificent spikes of glowing red blooms. Mine could never be like that, so it seems a pity to keep it in a pot, but its lovely colourings in winter make it useful as a house plant.

A. africana has longer, wide spreading, red toothed leaves, but not as many of them as the former. This one sheds its leaves periodically and retains just a rosette on top of its tall stem, dropping the old leaves as new ones grow to take their place. *A. thraskii* has a good head of leaves with a few pink teeth, but it does not look too happy in the glasshouse. To reach perfection it needs to grow on the sea coast in almost pure sand. This is not a desert plant nor does it like rocky exposed places.

These are all South African species but the next one, *A. serratifolia* with its "saw toothed leaves" and striking flower spike is a stranger. It appeals to me more than the other three as it is so much daintier. Its long narrow leaves grow upwards with recurved tips like a gracefully shaped vase or urn; the saw toothed edges are red. Half way down the stem is a circle of tiny offshoots, just like a little frill. In winter this plant is very colourful in shades of yellow, pale green and pink. It is in the winter too it sends up its lovely flower spike like a bright torch to cheer us during the cold dreary weather of July. It is of the red hot poker type, only these flowers are not packed tightly against the stem. When in bud they stand almost at right angles and droop only when they open. The individual flowers are reddish or orange apricot—the colour that now-a-days is called tango—a beautiful shade. Each petal tip brushed with green curls back and the end of the tube opens wide to allow the stamens through. These are yellow with anthers to match the petals and hang a good half inch

below the blossoms, like little dancing feet under a party frock.

Between two tall one is *A. eru* from Eritrea. And look the buds have opened at last! I have been watching them for some time and now the warmer weather of October has opened the lovely blossoms. This is not of the red hot poker type, but see, the flower stem has branched into three at the top and each branch has a head of delightful tubular flowers. Each little tube bulges toward the tip, curves in again, as though held by a rubber band, and then the tips flare out. The three petals forming the outer tube are soft honey yellow and the tips of the inner tube are brushed with golden brown. The stamens hanging to the side of the tube are about half an inch longer than the petals, are yellow with golden brown anthers. When the anther sacs burst they too are yellow with pollen. Short, pale apricot stems attach these lovely little bells to the main stem to form the dainty heads of flower. Here is another with an identical flower, but with an unbranched stem. The leaves of the rosette too are similar, except that *E. eru* has upright growth, whereas the other is obviously a cliff dweller. See how the leaves all tend to droop just as though hanging over a cliff? This plant clusters readily, whereas *A. eru* rarely produces an offshoot—at least that has been my experience. I have seen this cliff dweller labelled *A. eru* in many collections but that name cannot apply to both plants. It could be a variety.

In the corner against the trellis is *A. tenuior* with its "thin, slender" leaves and long bamboo-like stem. This is more or less a climber, but needs the support of undergrowth to keep it upright. The poker-like flower spike is not red hot this time, but green and cool looking. As the flower matures the green turns to lemon retaining a green mid rib. Later the lemon deepens in colour almost to orange. The petal tips of the inner tube are definitely bright orange, as are the pendant stamens with anthers still deeper in colour. These flowers all hang closely against the stem. December is its flowering time—mid summer (in New Zealand).

Against the centre trellis is the climbing Aloe *A. ciliaris*, with long thin leaves "fringed with fine hairs". It used to live in a pot here on the bench with the others, but as it grew so straggly and looked so sad I planted it in the ground (see Fig. 45 in the plan Ch. 1.) Now it is growing amazingly, sending out shoots



FIG. 92

Upper left, *Aloe arborescens*. Upper right, *A. thraskii*. Second row left, *A. africana*; right, *A. serratifolia*. Third row left, *A. eru*; right, *A. eru*. Bottom left, *A. ciliaris*. Bottom right, *A. tenuior*.



Top left, *Aloe mitriformis*. Top right, *A. mitriformis* hybrid. Second row left, *A. spinosissima*; right, *A. variegata*. Third row left, *A. aristata*; right, *A. aristata*. Bottom left, *A. striata* x *africana*. Bottom right, *A. striata* x *africana*.

FIG. 93

everywhere. One is even investigating conditions out side the top ventilator, but will have to come indoors before the cold weather arrives or a frost will nip it. What lovely flowers it has—like giant lachenalias aren't they? The petals forming the coral tube are tipped as usual with green as though the green from the mid rib has run into a blob. The inner tube is yellow and the stamens are only just discernable. As this Aloe has no definite flowering period it is all the more desirable. With flowers continuing through the year, even in the middle of winter it makes the trellis look very gay.

To see the rest of the Aloes—nearly all large plants—we will need to look under the edge of the center bench. There is the large "turban shaped" rosette of *A. mitriformis*. What a beautiful bud! Not the usual giant asparagus type at all, but a large flat head like a saucer. The unopened tubes radiate from a central hub like the spokes of a cart wheel, each circle being slightly smaller than the one below it. The top-most circle is only an inch in diameter while the outside one measures 5 to 6 inches across. Each smokey salmon pink tube is tipped with grey and as they lie in circles one above the other the effect is beautiful. It looks rather like a lovely cactus dahlia. As each tube opens, its little pink stem bends and the tubular flowers hang around the stem like a chandelier. The grey tips recurve and turn green to show the greenish yellow filaments which match the inner tube, while the anthers are deep salmon pink. As the main flower stem branches there are many heads of flowers to a stem.

A. variegata is so well known it needs no describing. Flowering very early in the spring, in August its short spikes of salmon pink blossoms is always most welcome. Next comes *A. spinosissima* another early bloomer. "Superlatively spiny" its name means. How true! This is a most difficult plant to handle as there are spines everywhere—along the edges as well as on the upper and lower surfaces. Many of the cream knobs which adorn the leaves on both sides, end in a sharp spine. The blue green leaves flushed with pinkish purple, with their cream knobs and spines are most decorative. A bronze green thick flower stem, like a giant asparagus, arises from the centre of the rosette. As the buds develop, straw coloured papery bracts, veined with red hold the individual flower stems in place. Bracts are very colourful as they also are flushed with red where they join the main stem. This is not long for an Aloe, being only 10 inches including the top 4 inches which produces the flowers. In the bud stage these stand erect, but as they mature they droop and hang on red stems like pendants. The red flowers with green tips, the stamens

just protruding, with their dark red anthers split to show the yellow pollen on the reverse side, make the plant a glorious piece of colouring.

Occupying much space is the huge rosette of the hybrid *A. striata* x *A. africana*, with wide, fleshy, tapering, light bluish green leaves, pink edged and pink toothed. There are no other markings. The 20 inch flower stem has branched into three, so instead of there being one red hot poker there are three. Of all this type of inflorescence this is definitely the most attractive. The greenish tipped, coral red flowers bordered with lemon, have a wider lemon border on the inner petals. These wide flaring petals show the long protruding yellow filaments tipped with deep coral anthers. A magnificent flower on a lovely plant.

A. aristata comes next, one of the smaller growing Aloes. It is composed of hundreds of very narrow leaves and has the appearance of a large speckled ball most of the year. But now it is flowering it has opened into a rosette, almost a flower in itself. Later it will again close into a ball. Although this plant does resemble a Haworthia it must be remembered it is an Aloe and be treated accordingly. Give it full sun and do not be over indulgent with the water. Then you too will have a ball instead of an open rosette which is not characteristic of this Aloe. Unfortunately that is how it is usually seen in collections. See the long, dried fine hair on the end of each leaf? Mid summer, December is flowering time. The red bells are more loosely arranged than others we have seen of this type. The long narrow tubes deeper in colour on the upper side with a purple stripe are paler on the under with a greenish stripe. The stem displaying the flowers is long and whippy and being branched, there are several heads of bloom.

The last two along here are the gems of the smaller species. *A. pachygaster* has a rosette of bright blue green leaves dusted with white powder, edged with cream teeth and with cream raised spots on both sides of most of the leaves, with more on the backs than the fronts. The inflorescence is again of the red-hot-poker type, about 18 inches long. The buds are a glorious shade of deep flamingo pink, almost coral red, but as the flowers open the colour fades to cream, with the green tips staining the tube almost half way. Golden stamens hang a good half inch below the tube with large red brown anthers, which split to show the golden pollen. One characteristic of this plant is that when the flowers fade they rise at right angles to the stem. Another is the long tapering bract, which longer even than the flower itself adds much to its attractiveness. Early spring—

August or September finds this one in bloom.

That brings us to the end of this group of Aloes, but Aloes are easily grown when one point is remembered. Do not bury the rosettes too deeply into the soil. The plant itself should sit on top of the soil with the roots only being buried. As the majority come from the hot regions of Africa they can stand all available sun. Most of them are frost tender but do well if put outside during the summer and returned under cover during frosty weather. The majority of mine are too large and heavy for me to

move, so they live, and as you have seen, flower quite happily here in the glasshouse. A rather wonderful peculiarity about Aloes is this. We have seen how many held their buds upright, then as the flowers opened they hung pendant. When they faded and the seeds set, the stems again revert to their original position, so the seeds in their cases are held upright. Nature thinks of everything. For unless the seeds were so held how could they ripen and remain in their seed cases until the time came for their dispersal?

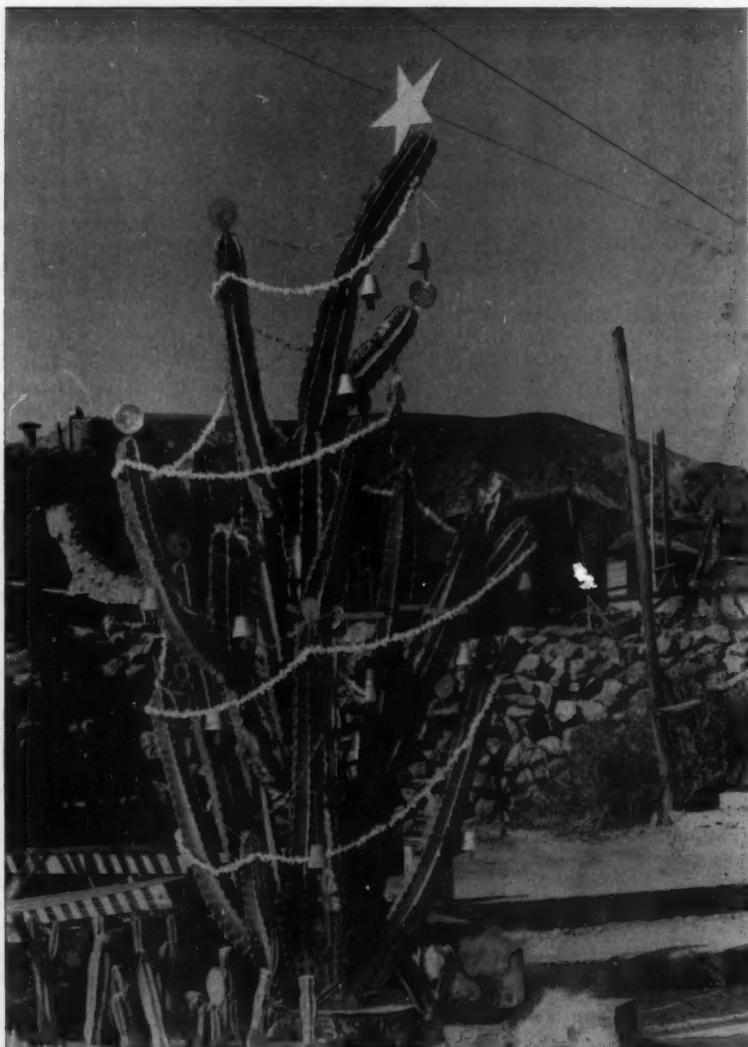


FIG. 94. A Cactus Christmas to you all. Ted Hutchison, proprietor of Cactus Corral, Calico Ghost Town, Yermo, California, decorates *Cereus peruvianus*.

SPOTLIGHT ON ROUND ROBINS

That membership in our robins may fluctuate is to be expected, perhaps, and while there is always a feeling of regret at separation with those who can not remain active participants, there is also the joy of greeting those who have recently joined. It gives me pleasure to welcome these of our newest members: Mr. George H. Young, Bethlehem, Pennsylvania; Mrs. Janeene Sims, Masterton, New Zealand; Mr. Leonard Randall, Salisbury, Massachusetts; Mrs. A. W. Ridings, Rotorua, New Zealand; Mrs. John Harasta, Binghamton, New York; Mrs. Alice H. Betz, Spokane, Washington; Señor F. Riviere de Caralt, Barcelona, Spain; Mrs. Rita O'Gorman, Rutherford, New Jersey; Mrs. Earl S. Smith, Beaumont, Texas. Happy robin days to all of you.

Among the proposals for new robins, of which there are several, one on rain forest plants has been requested by Lois Covey, and if pleasing to its members, she suggests it might be called "The Epiphyte Robin". Such plants as rhipsalis and bromeliads, peperomias, ceropegias, cryptanthus, weberocereus, puyas, lepismium, Chiapasia, and others which will grow in partial shade will be the subject matter of this robin. The only plant to be omitted will be the epiphyllum which already has a separate robin. There will be room for six members, and a most cordial invitation is given to those who grow such plants. Having had a chance to read some of Lois' letters in other robins, and knowing how much she puts into her letter writing, I should think this ought to be a very fine robin. If anyone is interested, please write to me.

Another new robin is one on Mesembrianthemums for which Lloydene Dodd has written to say, "Why not a robin on Mesembrianthemums? They are such lovely little plants and there are so many of them. A hundred and twenty genera—two thousand species—should make a most interesting robin." I think she is right. At about the same time Señor F. Riviere de Caralt, another member, wrote from Spain mentioning his interest in "the whole mesem group" as well as those other special interests of his "Opuntia, Agave and Yuccas (and) Aloes." With two interested members making a good start for this robin for mesems, four more would put it in flight. I shall be glad to hear from any of you mesem fans. In addition, with the thought of forming another robin on Yuccas, Agaves and Aloes which are Sr. Riviere de Caralt's specialty, let me hear from those who would like to join with him in such a robin. Four at least would be needed to start it off.

To fill in certain robins which have lost members, there is a place for a man in C. & S. Robin No. 8. Someone who lives in the northeast part of the country, in New England or neighboring states, please. Euphorbia No. 2 needs another member or two for its membership list. There are three members waiting for the Rare Cacti and Crests Robin to gather additional member that it may start its first flight. At least one more is needed but several would be welcome. The Decorator's Robin has changed its name to the C. & S. Arranger's Round Robin. I do hope that more members will write to join this specially interesting robin. If you are interested in arranging succulent material you would like this robin especially. An inquiry from Bryant Plitt says he would like to correspond with a Swiss member of our C. & S. Society, if we have such a member. I shall hope to hear from someone there and make the International Robin a reality.

I have chosen a few gleanings from robin letters which seemed especially worthy this time. There is a new little camera on the market this year which Agnes Hirshinger finds "the answer to our problems: cheap, simple, tailored to the job, inexpensive to operate, fool proof. Anybody can get good sharp closeup pictures

with it. I'm busily engaged in photographing my whole group of some 80-odd plants. The new camera "Star-tech" is available only from the New York distributor who has exclusive rights from Eastman manufacturing it. Intended for medical, dental, technological or other scientific and professional uses. It is just a simple box camera . . . but you can take pictures as close as 4—8 or 8—15 inches and get sharp, clear definition. It uses 127 roll film—Ektachrome Panatomix X or Verichrome Pan and gets 12 shots 1 1/2" x 1 1/2" to a roll." The price is \$34.95.

Agnes makes a point about watering which can never be said too often when she says "I think you will find that watering the Mams and some other plants will often not slow down or stop flowering when too enthusiastic about encouraging it. Some time ago I was having trouble with Mam zeilmanniana, advertised by Johnson as a prolific bloomer, that would bud and then come to nothing. I wrote Johnson and he said plants can bloom without being in active growth and that if growth is stimulated by water, in such cases, frequently the buds are reabsorbed. Marsden confirms this as to Mams and since I have followed this advice I have had splendid results." In another robin, Kathy Bierman commented on watering also, but a different plant was involved. She wrote, "I am tempted to keep Rebutia violaciflora upstairs on the window sill. Then water occasionally in winter. It did well the year I did this. Basement and no water gives few blossoms and a not too healthy looking plant. I guess the warmth keeps it from rotting when watered in the winter." Another point was brought out by Glenn Webb on prompt care of plants that "sit" when he wrote, "I kept wondering why the Hybrid Sunset did not set any buds or show vigorous growth. So I unpotted it. Roots were in a concrete-like mass of mineralized soil. I washed away some soil, put it in a slightly larger can and in two weeks it began to show flower buds. One can not be too slow in checking up on a plant which seems just existing."

In the Epiphyllum Robin the question was asked as to how much humidity these plants should have. Maude Price thinks the important thing is to get a good humidity guide and watch it. Also adding, "I turn the hose under my shelves in the greenhouse with a water breaker nozzle and let it run. The cold water helps with cooling the house too. I also put a sprinkler hose on the roof when it gets too hot. The cold water on the roof glass keeps it a few degrees cooler inside." She adds a tip for the Christmas cactus saying, "I believe day length has the most to do with its flowering, together with cool temperature at night. If any of you have them in the house, when evening comes keep them in the dark." For a feeding program she suggests, "it can be overdone, creating a toxic condition. A little regularly, twice a month will keep them well and happy."

In another Robin came a suggestion for rather drastic treatment of Epiphyllums to bring them into bloom as given by Dan Lynch. He wrote, "Epiphyllum culture my way is dangerous. First I plant the plant in lightened soil in the container in which it is to remain. After it is rooted fairly well I apply Lynch's constant to it, which is: Bring the plant out in full sun and allow it to remain there until it looks almost dead—yes, almost dead. The stems must be nearly all yellow and soft. Then take it out of the sun into complete shade for a few weeks. Water heavily while in the shade; then transfer into spot where it will stay. This process of nearly killing the plant on purpose has worked very well for me."

Of the Echinopsis Hybrids, Nick Glaviano reports, "Funny thing, Eleanor noticed that they just about last one day, so one night about midnight one opened with

the most lovely orchid coloring and terrific odor. She cut it off, seared the end with a match, and placed it in a glass of water. The bloom lasted one week that way."

Myrtle Coe mentions a graft of *Echinocereus reichenbachii* on *Cephalocereus chrysacanthus* stock which was most successful. She writes, "For years I have been trying to make *E. reichenbachii* bloom on its own roots to no avail. So when I had three beautiful blossoms all out on the same day I was really thrilled. Now the plant is popping out all over with new stems, so next year I should have a very nice specimen."

Mary Macarthur speaking of her Echeverias says, "At the present time, being midwinter (New Zealand), the long stemmed varieties with their colorful foliage and brilliant flower stems are at their best. Of these I find *Echeveria gibbiflora* var. *schultii* the most prolific for flowers (terracotta color). The handsomest plant of all is *E. crenulata* 'Rosea grandis', beautifully colored and no flower stems under five feet. Some plants, particularly Echeverias and Aeoniums, drop their lower leaves and thus create their own mulch. Plants in pots do not benefit this way, so I include a fair amount of leaf mould in their soil mixture."

Bernice Curnow in South Australia says, "We have most of our plants in pots but so many of them will be able to go into the ground, and am sure they will benefit from more root room, though we intend to keep a lot still in pots as it keeps them cleaner by far, especially the white varieties. We find that plants planted out very rarely get any wogs of any sort on them. Mostly get them on *Echinocereus*, and find some of the shrubby succulents are a pest, they harbor them, so are usually done away with when found like that as it isn't any sense keeping them amongst the better ones." Leslie Tookey in England wrote during the summer, "Buds popping up everywhere, and in unexpected places, especially plants recently received from your land. They arrived looking a bit sad, completely devoid of roots and very dry. Sometimes very rotten. I usually box them in a mixture of moist peat and coarse grit. They stay in this for a season and are then potted up normally. Some root in three or four days except *Astrophytum asterias* which is a bit difficult. Since last writing I have bedded out a small house with small plants, some imports, but mostly unusual seedlings, with the hope of getting some size on them more quickly; planting them out with what I thought would be enough room for two or three years, but the growth has been amazing. No more pots for me as far as possible. I have lots of *Echinocereus*, *Thelos*'s and *Coryphanthus* and these relish the bedding out treatment. I water well with Malathion (protecting from mealies). *Epithelantha* always seem to be a bit dehydrated when they arrive but plump up and flower well. I have imported some clumps and grown some from seed and they all flower well and set plenty of seed. The *Neolloydias* bloomed well, mostly with quite large purplish flowers on the new growth, and *Toumeyas* have large mam-like flowers, white and rather long, perhaps more like the *Dolichotheces*, five on a plant, but unless the light is really good they don't open too well. To buy economically, one has to buy quantity. This means perhaps 50 plants of a variety, and one just has to get rid of the surplus. You would be amazed at the difference in cost if one buys in bulk."

Bryant Plitt in Virginia comments, "I'll probably get ostracized for this but—one of the nicest plants with outdoor cactus is the humble rock-moss, *Portulaca*. It's kissing kin anyway. I've been simply taken with the myriad, sparkling colors all summer." He also mentioned a trip he made to Florida observing the plants and their use in landscaping, saying, "My relatives live in a new section with a sort of lagoon in back. Piled around the bank were chunks of coquina rock and

growing in what only could be pure sand were handsome specimens of *Agave americana* and what I believe to have been *Opuntia biglovii* with fierce ivory spines. There is no doubt that the Agaves are striking plants and make a wonderful accent in landscape design. I saw several homes where the planting was entirely succulents and some cactus. Some kept grass lawns and others used gravel. The gravel was white or buff and yellow. The plants, some were huge shrubs, were mulched with the gravel and a path would be a different color. All the common, more bush type *Euphorbias*—*grandicornis*, *splendens*, *ferox*—tree cerei, *Aloes*, *Agaves* and small succulents were used in landscape work."

Lois Covey said in one of her letters that "I must report that I had a wonderful time at the convention and enjoyed every minute of it. I shall certainly make every effort to attend as many conventions as I can. The next one—1961—is to be held in Mexico City! We'd better start saving our pennies!"

An invitation is always extended to any of you who would like to join the Round Robins of our C. & S. Society. You should be a member of the Society before writing to join a Robin, however. If you are not a member, you can always join and be eligible to take part in the Robins. Write me if you are interested. I shall be glad to find a place for you, whether a mere beginner or more seasoned collector.

(MRS.) GLADYS H. PANIS
P. O. Box 705, Falmouth, Massachusetts

Cereously Speaking

This year and last, I allowed my *Astrophytums* to bask in the strongest light in my greenhouse with a weekly watering, only. In early March I increased this to twice a week and the results are good. *O. asterias*, *A. myriostigma*, *A. ornatum* and *A. capricorne* have been flowering since mid-April. Rest, strong light, limited watering (corresponds to seasonal rains and droughts in Mexico) and warmth of my greenhouse (50 degrees F. where they were) confirmed my suspicions—to get flowers, group those that need like attention and use the method that gets results.

"Too much or too often potting" is as bad, in my opinion, as too little potting. My greenhouse shows this. The *Selenicereus*, *Hylocereus*, *Heliocereus*, *Epiphyllums*, *Euphorbias*, etc. with large root systems need larger and larger pots as well as more and more growing room. The results make it imperative to limit the size of one's collection of these gross feeders. To repot frequently for beautiful plants or partly starve them to limit growth so one can have more plants, is the question. I'm a believer in all of these methods to a limited extent.

A collector of these exotic plants must decide if he wants to grow them in a limited space by dwarfing them. I can't resist both cacti and the other succulents and I will not specialize. I can't afford larger greenhouses and extra help. Result: Stacked benches and storage and a little of everything.

I've been asked how much cold a "cold house" plant will tolerate. Well, up to now I had very little experience with this problem. A flash cold will not do much damage to plants which have been kept on the dry side. However there are plants within plant groups that have been lumped together as standing temperatures of 30 to 40 degrees that should have been given more study. I have kept some of these in cool storage and it was fine. Later I moved them out to the benches. As far as I could tell, the temperatures varied less than a few degrees from which they had been while in storage.

They were kept on the dry side. During a near zero day in January I found some of them had frosted at the pot level and collapsed. The top parts were not harmed and I saved the plants. This was true of both cacti and succulents: *Cephalocereus*, *Heliocereus*, *Acanthocereus*, *Nyctocereus*, *Bryophyllums*, *Euphorbias*, *Crassulas*, *Aloes*, etc. The temperature was well below 30 degrees for at least four hours. Some of the plants I considered tender were near the frosted glass but showed no ill effects. The ones that were on the benches that showed frost damage indicated that the cold flowed much like a stream of water in and out, up and down, and deep and shallow. Some were quite narrow while others were quite wide. *Cleistocactus*, *Mammillarias*, *Ferocactus*, *Monvillea*, and *Harrisia* proved hardy—some as seedlings and some as adult plants. The *Pereskias* showed a slight drooping of the leaves but even this disappeared within 24 hours. The *Kitchingias*, four feet to eight feet tall, showed frost damage in the tops of the 8-footers only (within a foot of the frosted glass).

What guarantees flowers? Sunshine, humidity, dry air, good soil, partial shade, cool nights and warm days, even temperatures at night, dryness in winter and spring, liberal water in summer, early spring watering with gradual increase as summer advances, and so on. My experiences checked with my diary seem to emphasize that the previous year's sunshine and warmth increases the number of flowers in the next year whether the plants are shade-lovers or full-sun.

Yes, there are plants that once they reach maturity do not bloom regularly no matter what the previous year's sunshine but for me these are the ones that are shade-lovers during the growing season with winter sunshine during their resting and flowering period. The number of other succulents that flower varies from year to year and frequently I'm overjoyed to see buds on old friends but shy to flower under ordinary conditions. There are dependables, alternate years, and surprise bloomers in my collection. Perhaps there are annual, biennial, and perennial flowers as well as plants. I do not claim to have ideal conditions but most seem happy in my care.

I always put the plant in the same place year after year where it bloomed. I find that it repeats its performance year after year. So my conclusion is that an ideal spot once, it is for always. There are some exceptions in those that seem to "sulk".

I'm trying a new method with my *Epiphyllums*. I set the pots on the ground among the ivy vines where the roots stay cool. Then I stick the stems, some of them four feet long, out through the grape vines where the hot afternoon sun bakes them from 2 to 7 p.m. The stems show a reddish coloration and it is on these stems that I get plenty of flowers and never on the stems that do not get "baked".

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FIG. 95. An exhibit of Julius Roehrs, Rutherford, N. J., in the Sunken Garden at Rockefeller Center, New York City. This summer exhibit was seen by thousands of visitors who were greatly interested in the correctly named plants. This exhibit demonstrated that these exotics enjoy a vacation outdoors during the summer season even in the temperate climate rather than be cooped up in some greenhouse.

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